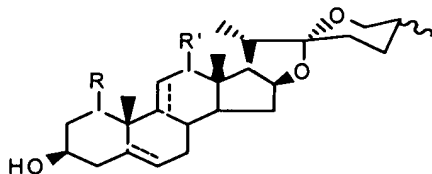


## CLAIMS

### WHAT IS CLAIMED IS:

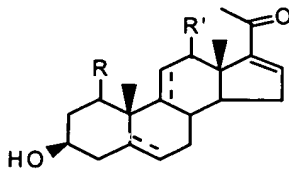
1, A clean technology of producing 16-dehydropregnenolone and its analogs, that is, the pure or the crude pseudo steroidal sapogenin, derived from steroidal sapogenin, dissolved in organic solvent, reacts with hydrogen peroxide for 0.5-24h at 0-80°C with/without metal compound and acid as catalyst, wherein the molar ratio of pseudo steroidal sapogenin, hydrogen peroxide, metal catalyst and acid is 1:1.0-4.0:0.001-1:0-1, of which 1:1.5-2.5:0.005-0.02:0 is preferred, and the base is added to the mixture and then the mixture is kept at 0-100°C or in reflux for 0.5-2 hour to give 16-Dehydropregnenolone or its analog, accompanied with the other product 4R(or S)-methyl-5-hydroxypentate, which is converted to 4R(or S)-methyl- $\delta$ -pentyl lactone after acidification and extraction from the water layer.

The mentioned steroidal sapogenin is of the structure:



in which R or R' is H or OH, C-5(6) and/or C-9(11) is C-C or C=C, C-25*R* or C-25*S*, and C-5 is 5 $\alpha$ -H or 5 $\beta$ -H when C-5(6) is C-C.

The structure of the mentioned 16-dehydropregnenolone and its analogs can be outlined below:



in which R or R' is H or OH, C-5(6) and/or C-9(11) is C-C or C=C, and C-5 is 5 $\alpha$ -H or 5 $\beta$ -H when C-5(6) is C-C.

The mentioned metal catalyst include: tungstic oxide, tungstate, vanadic acid, vanadate, vanadyl acetylacetonate, molybdic anhydride, molybdate, phosphomolybdate, heteropolyacid and heteropolyate.

The mentioned acid include carboxylic acid, sulfonic acid and inorganic acid, where the carboxylic acid is preferable to be acetic acid, formic acid, propionic acid, butyric acid, benzoic acid, phthalic acid and isophthalic acid, the sulfonic acid is preferable to be benzenesulfonic acid and p-toluene sulphonic acid, and the inorganic acid is preferable to be sulfuric acid, phosphoric acid and

phosphorous acid.

The mentioned organic solvent include dihalogen methane, trihalogen methane, dichloroethane, ethanol, butanol, t-butanol, dimethyl sulphoxide, N,N-dimethylformamide, acetone, butanone, cyclohexanone, acetonitrile, ethyl acetate and acetic acid.

The mentioned base include: hydroxid, carbonate and bicarbonate, preferably to be sodium hydroxide, potassium hydroxide, lithium hydroxide, cesium hydroxide, sodium carbonate, potassium carbonate, lithium carbonate, cesium carbonate, sodium bicarbonate and potassium bicarbonate.

2, A process as defined in claim 1, wherein the steroidal sapogenin is diosgenin, tigogenin, sarsasapogenin, hecogenin, the other natural steroidal sapogenin or the analogs modified from natural steroidal sapogenin.

3, A process as defined in claim 1, wherein the molar ratio of pseudo steroidal sapogenin, hydrogen peroxide, metal catalyst and acid is 1:1.0-4.0:0.001-1:0-1, of which 1:1.5-2.5:0.005-0.02:0 is preferred.

4, A process as defined in claim 1, wherein 16-Dehydropregnenolone or its analog is obtained as precipitate after water was added to the reaction mixture and the water layer is acidified and extracted with organic solvent to give 4R(or S)-methyl- $\delta$ -pentyl lactone.